The Purpose of Today

• To begin the process of determining if there is evidence of disease or cancer clusters in the geographic location?
Definition of a Cluster

CDC defines a cancer cluster as:

- a greater than expected number
- of cancer cases
- that occurs within a group of people
- in a geographic area
- over a period of time.
Is the number is greater than expected if the observed number of cases is higher than one would typically observe in a similar setting (in a group with similar population, age, race, or sex).

• Who are the members of our group that have cancer?
• What are we comparing our group against?
Do all of the cases involve the same type of cancer, or types of cancer scientifically proven to have the same cause?

• What kind of cancer do the members of our group have?

• Do we know what causes those kinds of cancers?
The population must be carefully defined by factors such as race, ethnicity, age, and sex, for purposes of calculating cancer rates (expressed as the number of cases per 100,000 person over a specific period of time).

- Beware of the “sharpshooter fallacy.”
- Can we identify all the affected persons?
The Sharpshooter Fallacy
Both the number of cancer cases included in the cluster and calculation of the expected number of cases can depend on how we define the geographic area where the cluster occurred. The boundaries must be defined carefully. It is possible to “create” or “obscure” a cluster by selection of a specific area.

• Have we defined the geographic area?
• What kind of criteria are we using?
The number of cases included in the cluster—and calculation of the expected number of cases—will depend on how we define the time period over which the cases occurred.

• Have we defined the time frame over which the cases occurred?
• What kind of criteria are we using?
• At least 10 years, never one year alone.
Association vs. Causation

- **Causation**: The action of directly causing or producing an event.
- **Association**: A connection between events that may or may not be causally linked.
- **Strength**: How strong is the statistical association between the risk factor and the illness?
- **Consistency**: How many studies have found the same relationship between a specific agent or risk factor and a specific illness?
- **Specificity**: Is the risk factor only related to this disease? If so, the probability of a causal relationship is high.
Four-Step Process for Evaluating Suspected Clusters

The CDC has developed a four step guideline to investigate suspected clusters. They are:

**Step 1**: Initial contact and response

**Step 2**: Assessment

**Step 3**: Determining the feasibility of conducting an epidemiologic study

**Step 4**: Conducting an epidemiologic study to assess the association between cancers and environmental causes.
Important Items to Consider

• Some cancer rates (e.g., breast cancer) may be higher due to better medical care or screening in certain areas.

• Cancer rates in each group or community tend to change over time because the community changes.

• Cancer is at least partly a disease of aging.

• Cancer is not one disease, but many.

• Cancer can take a long time to develop.

• Cancer is a common disease.
Bay County Data

Age-Adjusted Invasive Cancer Incidence Rates in Michigan
All Sites, 2003 - 2013
By County
Age-Adjusted to the 2000 U.S. Standard Million Population

Michigan Rate: 489.36 / per 100,000

- 340.65 - 419.13
- 430.14 - 455.10
- 456.55 - 489.56
- 491.33 - 587.38

Risk Population less than 2500
Bay County Cancer Data

Invasive Cancer Incidence Rates in Bay County, Michigan
All Sites, 2003 - 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
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<th>2007</th>
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<tr>
<td>Population at Risk</td>
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<td>109453</td>
<td>109165</td>
<td>108711</td>
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<td>107913</td>
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<td>107477</td>
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<td>1190445</td>
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<tr>
<td>Total Cases</td>
<td>692</td>
<td>611</td>
<td>660</td>
<td>777</td>
<td>727</td>
<td>715</td>
<td>634</td>
<td>562</td>
<td>682</td>
<td>583</td>
<td>587</td>
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<td>Crude Rate</td>
<td>631.62</td>
<td>558.23</td>
<td>604.59</td>
<td>714.74</td>
<td>672.33</td>
<td>660.08</td>
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<td>521.84</td>
<td>634.55</td>
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<td>Age-Adjusted Rate</td>
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<td>Statewide Age-Adjusted Rate</td>
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Note: All rates are per 100000. Rates are age-adjusted to the 2000 U.S. Standard Million Population.
Rates generated on March 21, 2017
Based on data released April 15, 2015
Preliminary Analysis

• Contacted MDHHS--Michigan Cancer Surveillance Program (MCSP)--to review Cancer Data for Census Tracts 285900 and 286000

• MCSP has calculated Standardized Incidence Ratios (SIRs) for four sites, including all invasive cancers, bone and soft tissue, lung and bladder cancers. There were no ratios of observed to expected cases significantly higher in the time period of 2004 to 2013.
Census Tracts
Timelines for Evaluating Suspected Clusters

**Step 1:** Initial contact and response (Feb - March)

**Step 2:** Assessment (April – June)

**Step 3:** Determining the feasibility of conducting a full epidemiologic study (June – July)

**Step 4:** Conducting an epidemiologic study to assess the association between cancers and environmental causes.
What You Can Expect

• This is a voluntary process, it is not mandatory. You can stop at any time.
• We take your privacy and confidentiality seriously. No individual information collected will be shared with anyone outside of the official investigation.
• Tracy Metcalfe and/or Liz Warmbier will contact you and set up an appointment to discuss your or your families health history in the context of the cluster investigation.
Next Steps

1. Individual Meetings – April/May
2. Collation of Initial Data – April/May
3. Follow Up – May/June
4. Recommendation – June/July
For More Information

• Bay County Website: www.baycounty-mi.gov/health

• Individual Inquiries:
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